

CLAIMS:

1 1. A mobile system, comprising:
2 a storage device;
3 a vibration sensor arranged to detect whether there is a presence of sustained or sporadic
4 mechanical vibrations over a designated time duration, and to generate therefrom a vibration
5 signal indicating the presence of sustained or sporadic mechanical vibrations; and
6 a chipset having a storage controller arranged to control accesses to said storage device,
7 including limiting accesses to said storage device to minimize damages to said storage device in
8 response to the vibration signal indicating the presence of sustained or sporadic mechanical
9 vibrations.

1 2. The mobile system as claimed in claim 1, further comprising:
2 a position sensor arranged to detect whether there is a change in the position of said
3 mobile system at a fixed or variable velocity or acceleration, and to generate a position signal
4 indicating the change in the position of said mobile system.

1 3. The mobile system as claimed in claim 2, wherein said storage controller of said
2 chipset further limits accesses to said storage device to minimize damages to said storage device
3 in response to the position signal indicating the change in the position of said mobile system.

1 4. The mobile system as claimed in claim 3, wherein said storage device
2 corresponds to a hard disk drive.

1 5. The mobile system as claimed in claim 4, wherein said storage controller contains
2 registers for the following purposes: (1) set timing (delay, burst size) to control frequency of
3 read/write cycles; (2) set burst size to control how much data is transferred during each
4 read/write cycle; and (3) completely block hard disk access (read or write) if the vibration signal
5 indicates the presence of strong sustained vibrations for short periods of time.

1 6. The mobile system as claimed in claim 4, wherein said storage controller
2 comprises:

3 control registers arranged to set the parameters for individual transfers (read or write)
4 based on the vibration signal from said vibration sensor or the position signal from said position
5 sensor regardless whether said mobile system is operating in a normal (stationary) mode or a
6 mobile (Navigation) mode, wherein said parameters include a burst size, a transfer count, and a
7 base memory address;

8 first-in/first-out (FIFO) devices arranged to provide line buffering required for data
9 transfers to said storage device; and

10 control logic arranged to set up the FIFO threshold level of the FIFO devices and the
11 delay time, via the control registers in order to write/read data to/from said storage device.

1 7. The mobile system as claimed in claim 6, wherein said control logic initiates
2 writing data to said storage device, waits until the delay time set is completed and the FIFO
3 threshold level is reached before data can be written onto said storage device.

1 8. The mobile system as claimed in claim 4, wherein said position sensor is
2 implemented with communication devices using Bluetooth™ standards or Global Position
3 System (GPS) standards.

1 9. The mobile system as claimed in claim 8, wherein said position sensor is used to
2 trigger the mobile system to operate in a Navigation mode when the mobile system is out of
3 position or disconnected from a Bluetooth Access Point, and exit from the Navigation mode
4 when the mobile system is stationary or connected with said Bluetooth Access Point.

1 10. A computer system, comprising:
2 a disk drive;
3 a host processor equipped with an operating system (OS) which enables operation in a
4 normal mode when the computer system is stationary and a Navigation mode when the computer
5 system is mobile;
6 a vibration sensor arranged to detect whether there is a presence of sustained or sporadic
7 mechanical vibrations over a designated time duration, and to generate therefrom a vibration
8 signal indicating the presence of sustained or sporadic mechanical vibrations;

1 a position sensor arranged to detect whether there is a change in the position of the
2 computer system at a fixed or variable velocity or acceleration, and to generate a position signal
3 indicating the change in the position of the computer system; and

4 a chipset equipped with a disk drive control logic arranged to control disk accesses to
5 said disk drive, including controlling disk accesses to said disk drive in order to reduce damages
6 to said disk drive in response to the vibration signal indicating the presence of sustained or
7 sporadic mechanical vibrations or the position signal indicating the change in the position of the
8 computer system.

1 11. The computer system as claimed in claim 10, further comprising:

2 a flash memory connected to the chipset, to store a set of system basic input/output start
3 up (BIOS) instructions at startup, and ACPI instructions implemented to provide various power
4 saving functions, manage the progress of power saving between full-on, standby, and sleep
5 mode, and to provide transitions between the normal mode when the computer system is
6 stationary and the Navigation mode when the computer system is mobile from applicable ACPI
7 states.

1 12. The computer system as claimed in claim 11, wherein said disk drive control
2 logic contains registers for the following purposes: (1) set timing (delay, burst size) to control
3 frequency of read/write cycles; (2) set burst size to control how much data is transferred during

1 each read/write cycle; and (3) completely block hard disk access (read or write) if the vibration
2 signal indicates the presence of strong sustained vibrations for short periods of time.

1 13. The computer system as claimed in claim 11, wherein said disk drive control
2 logic comprises:

3 control registers arranged to set the parameters for individual transfers (read or write)
4 based on the vibration signal from said vibration sensor or the position signal from said position
5 sensor regardless whether said mobile system is operating in a normal (stationary) mode or a
6 mobile (Navigation) mode, wherein said parameters include a burst size, a transfer count, and a
7 base memory address;

8 first-in/first-out (FIFO) devices arranged to provide line buffering required for data
9 transfers to said disk drive; and

10 control logic arranged to set up the FIFO threshold level of the FIFO devices and the
11 delay time, via the control registers in order to write/read data to/from said disk drive.

1 14. The computer system as claimed in claim 13, wherein said control logic initiates
2 writing data to said disk drive, waits until the delay time set is completed and the FIFO threshold
3 level is reached before data can be written onto said disk drive.

1 15. The computer system as claimed in claim 10, wherein said position sensor is
2 implemented with communication devices using Bluetooth™ standards or Global Position
3 System (GPS) standards.

1 16. The computer system as claimed in claim 10, wherein said position sensor is used
2 to trigger the mobile system to operate in a Navigation mode when the mobile system is out of
3 position or disconnected from a Bluetooth Access Point, and exit from the Navigation mode
4 when the mobile system is stationary or connected with said Bluetooth Access Point.

1 17. The computer system as claimed in claim 10, wherein, when the Navigation mode
2 is triggered in response to the vibration signal or the position signal, said disk drive control logic
3 of the chipset changes system settings and configurations for operation in the Navigation mode,
4 and said operating system (OS) then detects the Navigation mode entry and changes OS settings
5 and configurations for operation in the Navigation mode.

1 18. The computer system as claimed in claim 17, wherein, when there is a break from
2 the Navigation mode, said disk drive control logic of the chipset changes system settings and
3 configuration for operation in the normal stationary mode, and said operating system (OS) then
4 detects the exit from the Navigation mode and changes OS settings and configurations for
5 operation in the normal stationary mode.

1 19. A method for enabling a mobile PC having an operating system (OS) and a
2 chipset configured to transition between a normal (stationary) mode and a Navigation (mobile)
3 mode, comprising:

4 receiving an indication from a vibration sensor or a position sensor attached to the
5 chipset, which requests operation in a Navigation (mobile) mode when there is a presence of
6 sustained or sporadic mechanical vibrations over a designated time duration or when there is a
7 change in the position of the mobile PC at a fixed or variable velocity or acceleration;

8 changing, at the chipset, system settings and configurations for the mobile PC to operate
9 in the Navigation (mobile) mode;

10 detecting, at the operating system (OS), the Navigation (mobile) mode entry and
11 changing OS settings and configurations for the mobile PC to operate in the Navigation (mobile)
12 mode;

13 determining whether there is a break from the Navigation (mobile) mode;

14 changing, at the chipset, system settings and configurations for the mobile PC to operate
15 in back in the normal (stationary) mode, when there is a break from the Navigation (mobile)
16 mode; and

17 detecting, at the operating system (OS), the Navigation mode exit and changing OS
18 settings and configurations for the mobile PC to operate in the normal (stationary) mode.

1 20. The method as claimed in claim 19, wherein said system settings and
2 configurations for the mobile PC to operate in the Navigation (mobile) mode include setting

3 parameters for individual transfers (read or write) based on the indication from said vibration
4 sensor or said position sensor, in which said parameters include a burst size, a transfer count, and
5 a base memory address; and setting up a threshold level of FIFO devices and the delay time in
6 order to initiate writing data to said disk drive, wait until the delay time set is completed and the
7 FIFO threshold level is reached before data is written onto said disk drive.

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